

## The concept of a functional unit of the gut

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### Abstract

The concept of a functional unit (FU) as the basic element of the gut as a mechanical structure is presented. The FU is a geometrically and morphofunctionally defined part of the gut modeled as a soft cylindrical orthotropic shell. The wall of the shell formed of the two distinct layers of muscle - the longitudinal and circular, respectively. The myoelectrical activity of both layers is controlled by pacemaker cells, analogous to interstitial cells of Cajal type MP (ICC-MP). The mechanical properties of the wall of the FU are nonlinear and deformations are finite. The dynamics of the generation of coupled electromechanical waves of contraction/relaxation as a response to a discharge of ICC-MP and an increased in intraluminal pressure is studied numerically.

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